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मानक

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Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 11173-1 (1985): Recommendations for Tool Shanks 7/24 Taper for Numerically Controlled Machine Tools with Automatic Tool Changers (tool rotating type), Part 1: Tool Shanks [PGD 32: Cutting tools]



“ज्ञान से एक नये भारत का निर्माण”

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“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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Indian Standard



RECOMMENDATIONS FOR  
TOOL SHANKS 7/24 TAPER FOR NUMERICALLY  
CONTROLLED MACHINE TOOLS WITH AUTOMATIC  
TOOL CHANGERS ( TOOL ROTATING TYPE )

PART 1 TOOL SHANKS

**1. Scope** — Covers the dimensions and other requirements of tool shanks 7/24 taper to be used on numerically controlled machine tools with automatic tool changers ( tool rotating type ).

**1.1** A schematic diagram showing the general arrangement of the components like tool adaptor and retention knobs is given in Appendix A.

**2. Types** — The tool shanks shall be of the following types:

Type A — As given in Table 1.

Type B — As given in Table 2.

**3. Dimensions** — Shall be as given in Tables 1 and 2.

**3.1** The cone angle tolerance shall be AT4 according to IS : 7615-1975 'System of cone tolerances'.

**4. Material** — Alloy steel having a tensile strength not less than 800 MPa in the core after case hardening.

**5. Hardness** — Shall be 590 to 670 HV after case hardening. The threaded portion shall be left unhardened.

**6. General Requirements**

**6.1** Tolerance on dimensions without specified tolerances shall be of 'medium' class according to IS : 2102 ( Part 1 )-1980 'General tolerances for dimensions and form and position: Part 1 General tolerances for linear and angular dimensions ( second revision )'.

**6.2** The shanks shall be manufactured in one piece and shall be free from cracks, burrs and other manufacturing defects.

**7. Protective Coating and Packing**

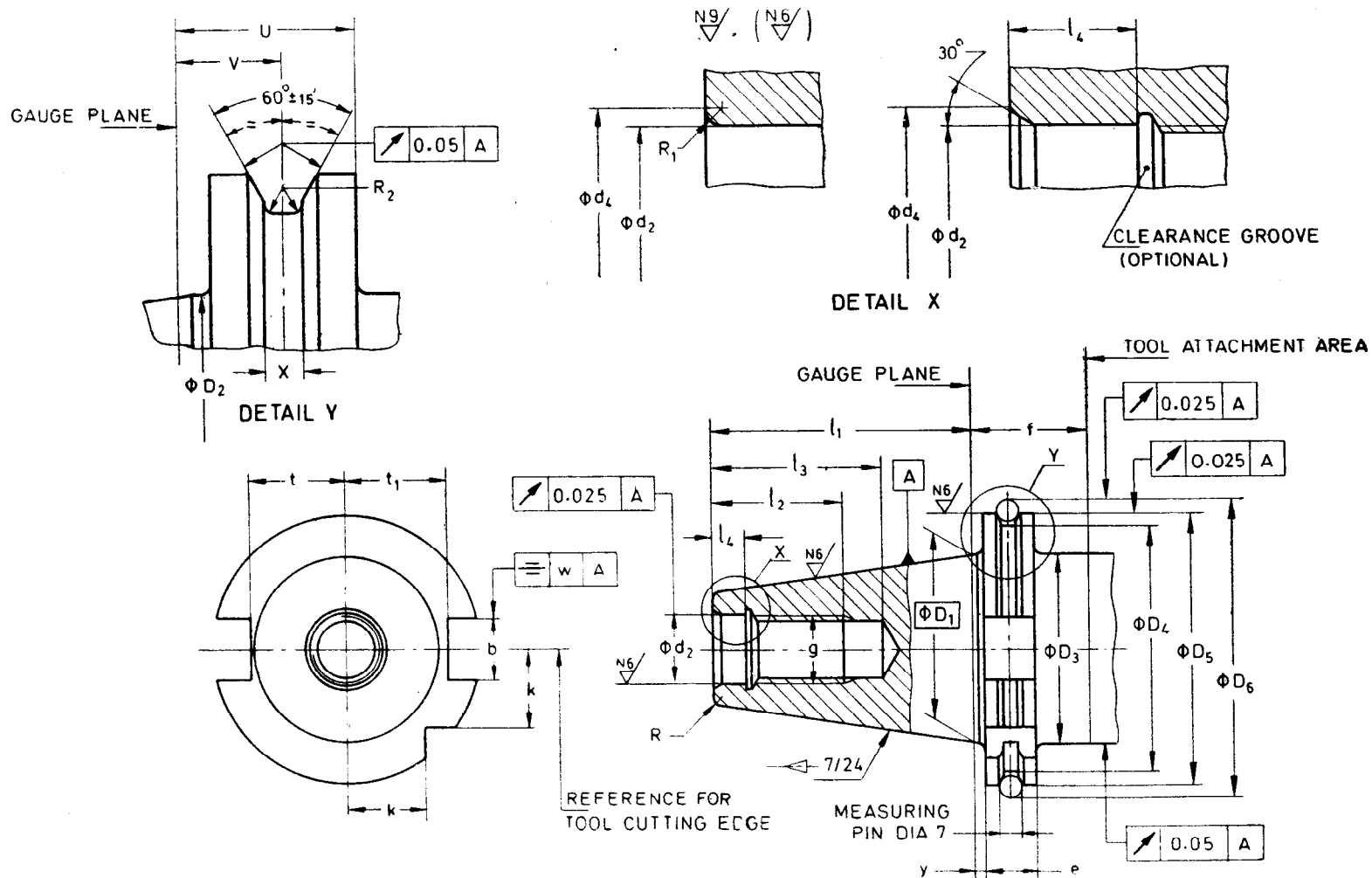
**7.1** Each shank shall be covered with a suitable rust proofing material and wrapped in a non-absorbent paper.

**7.2** Each shank shall be packed in a carton bearing the designation, manufacturer's name or trade-mark.

**TABLE 1 DIMENSIONS OF TOOL SHANKS, TYPE A**

(Clauses 2 and 3)

All dimensions in millimetres.



Designation	$b$ H12	$D_1^*$	$D_3 \begin{smallmatrix} \dagger \\ 0 \\ -0.5 \end{smallmatrix}$	$D_4 \begin{smallmatrix} \dagger \\ 0 \\ -0.5 \end{smallmatrix}$	$D_5 \begin{smallmatrix} \dagger \\ 0 \\ -0.1 \end{smallmatrix}$	$D_6 \begin{smallmatrix} \dagger \\ \pm 0.05 \end{smallmatrix}$	$d_2$ H7	$d_4$ Max	$f$ Min	$e$	$g$	$k_2 \begin{smallmatrix} \dagger \\ 0 \\ -0.3 \end{smallmatrix}$	$l_1 \begin{smallmatrix} \dagger \\ 0 \\ -0.3 \end{smallmatrix}$	$l_2$ Min	$l_3$ Min	$l_4 \begin{smallmatrix} \dagger \\ +0.5 \\ 0 \end{smallmatrix}$
A40	16.10	44.45	44.70	56.25	63.55	72.30	17	19.00	35	15.90	M16	18.50	68.40	32	42.50	8.20
A45	19.30	57.15	57.40	75.25	82.55	91.35	21	23.40	35	15.90	M20	24.00	82.70	40	52.50	10.00
A50	25.70	69.85	70.10	91.25	97.50	107.25	25	28.00	35	15.90	M24	30.00	101.75	47	61.50	11.50

Designation	$R \begin{smallmatrix} \dagger \\ 0 \\ -0.5 \end{smallmatrix}$	$R_1 \begin{smallmatrix} \dagger \\ 0 \\ -0.5 \end{smallmatrix}$	$R_2 \begin{smallmatrix} \dagger \\ 0 \\ -0.5 \end{smallmatrix}$	$t \begin{smallmatrix} \dagger \\ 0 \\ -0.4 \end{smallmatrix}$	$t_1 \begin{smallmatrix} \dagger \\ 0 \\ -0.4 \end{smallmatrix}$	$U \begin{smallmatrix} \dagger \\ 0 \\ -0.1 \end{smallmatrix}$	$V \begin{smallmatrix} \dagger \\ \pm 0.1 \end{smallmatrix}$	$w$	$X \begin{smallmatrix} \dagger \\ +0.15 \\ 0 \end{smallmatrix}$	$y \begin{smallmatrix} \dagger \\ \pm 0.1 \end{smallmatrix}$
A40	1.20	1.00	1	22.80	25.00	19.10	11.10	0.12	3.75	3.20
A45	2.00	1.20	1	29.10	31.30	19.10	11.10	0.12	3.75	3.20
A50	2.50	1.50	1	35.50	37.70	19.10	11.10	0.20	3.75	3.20

**Note 1** — Tolerances on  $\phi$  7 shall be according to IS : 4349-1967 ' Specification for precision rollers '.

**Note 2** — Cylindrical connection at diameter  $D_2 = D_1 - \begin{smallmatrix} 0 \\ 0.05 \end{smallmatrix}$ .

**Note 3** — Clearance groove for grinding at the discretion of manufacturer.

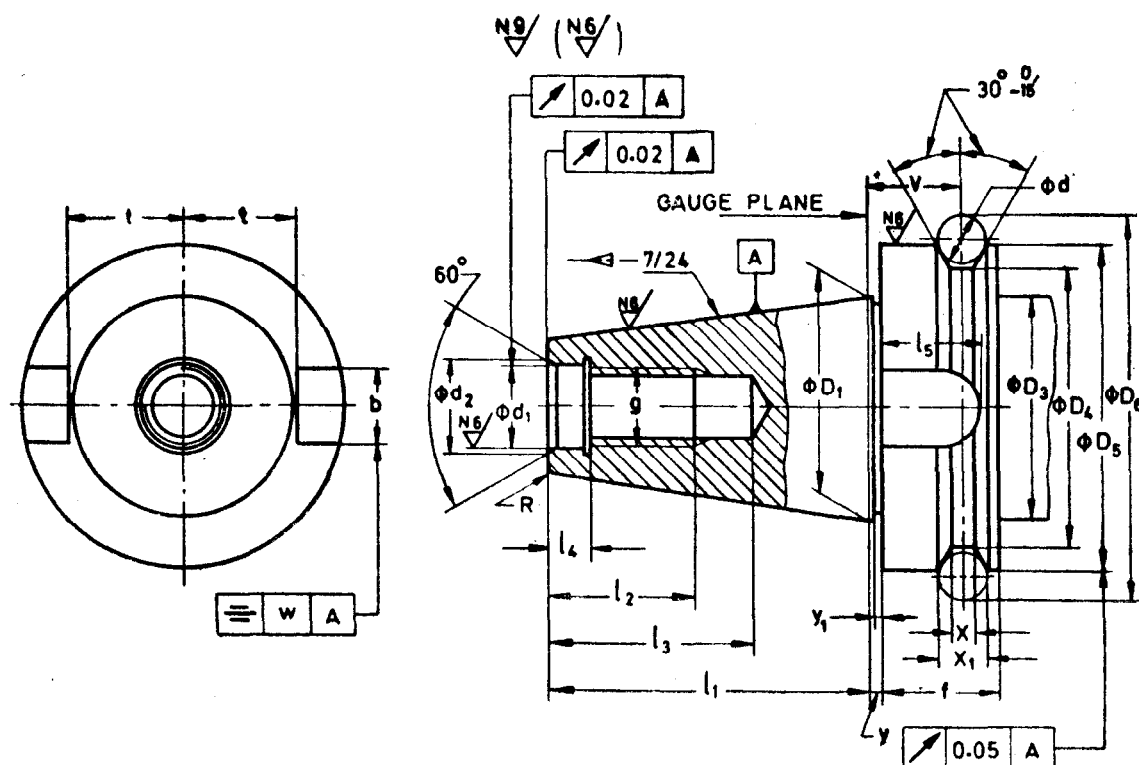
\* $D_1$  — Basic diameter enclosed in the gauge plane.

† $D_3$  — For individual requirements, adopt the following values of  $D_3$ :

Designation	A40	A45	A50
$D_3$ Max	50	63	80

TABLE 2 DIMENSIONS OF TOOL SHANKS, TYPE B

( Clauses 2 and 3 )



All dimensions in millimetres.

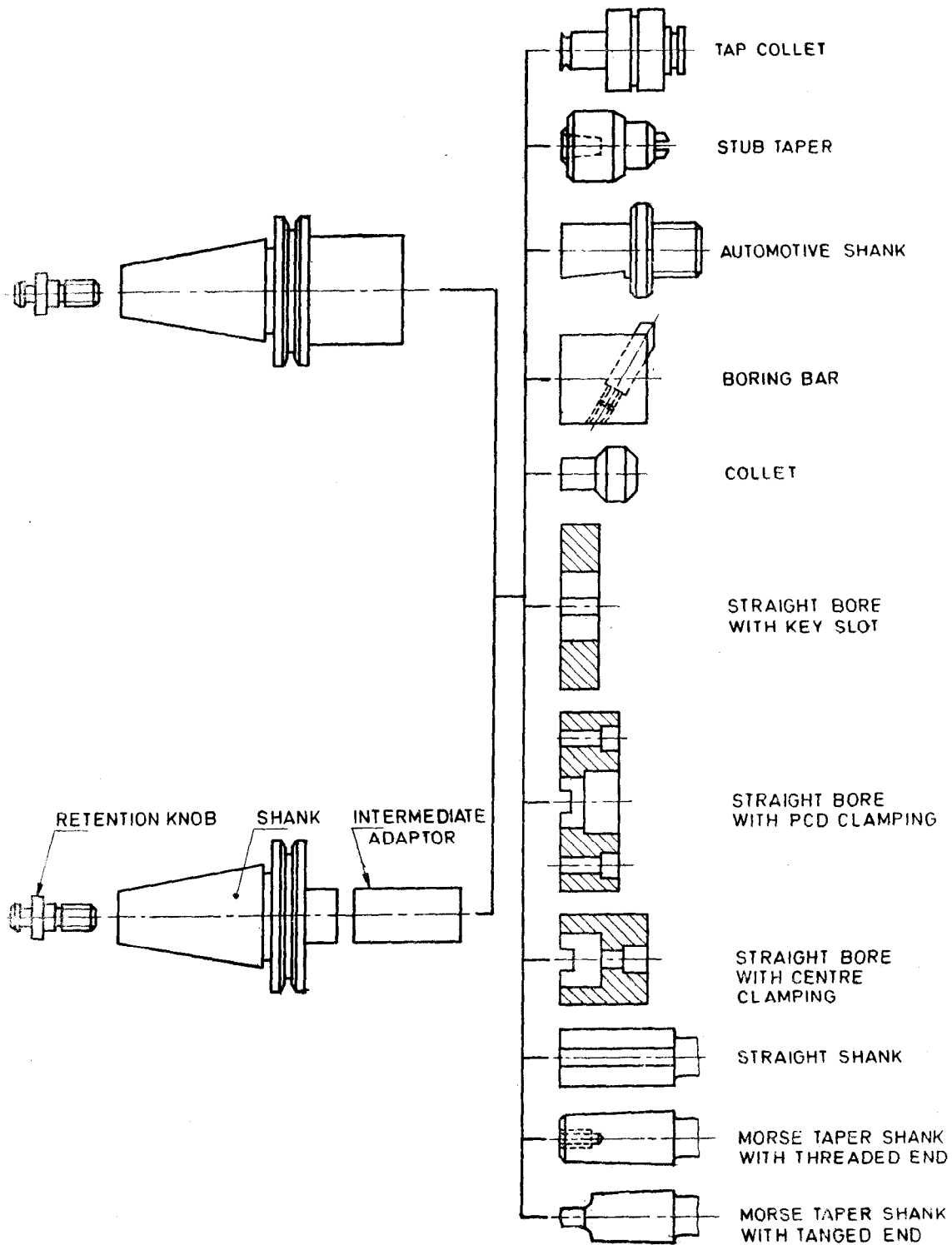
Designation	$D_1$	$l_1 \pm 0.2$	$R_1$ Max	$l_4 +0.5$ 0	$l_2$ Min	$l_3$	$d_1$ H8	$g$	$d_2$	$t$ 0 -0.2	$b$ H12	$l_5$ Min	$D_3$ 0 -0.5
B30	31.75	48.4	0.5	7.0	24	34	12.5	M12	14	16.3	16.1	17	32.00
B40	44.45	65.4	1	9.0	30	43	17	M16	19	22.6	16.1	21	44.70
B45	57.15	82.8	1	11.0	38	53	21	M20	23	29.1	19.3	26	57.40
B50	69.85	101.8	1	13.0	45	62	25	M24	27	35.4	25.7	31	70.10

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Designation	$w$	$D_4$	$D_5$ h8	$f$	$y \pm 0.4$	$y_1$ 0 -0.4	$V$ -0.1	$X$	$X_1$ +0.1 0	Small end dia of taper	$d$	$D_6$
B30	0.12	38	46	20	2	2	13.6	4	8	17.633	8	56.144
B40	0.12	53	63	25	2	2	16.6	5	10	25.375	10	75.679
B45	0.12	73	85	30	3	3	21.2	6	12	33.000	12	100.215
B50	0.12	85	100	35	3	3	23.2	7	15	40.185	15	119.019

# APPENDIX A

( Clause 1.1 )

## GENERAL ARRANGEMENT OF COMPONENTS





**EXPLANATORY NOTE**

This standard covers tool shanks only. The retention knobs are covered in Part 2 of this standard [ IS : 11173 ( Part 2 )-1985 ].

In the preparation of this standard considerable assistance has been derived from ISO 7388/1-1983 'Tool shanks with 7/24 taper for automatic tool changers — Shanks of 40-45 and 50 dimensions', issued by the International Organization for Standardization ( ISO ).

Tool shanks of Type A conform to ISO 7388/1-1983, Type B conforms to MAS 403-1982 'Dimensions for tool shanks and retention knob for machining centres', issued by the Japan Machine Tool Builders' Association.

# AMENDMENT NO. 1 MARCH 1989

TO

## IS : 11173 ( Part 1 ) - 1985 RECOMMENDATIONS FOR TOOL SHANKS 7/24 TAPER FOR NUMERICALLY CONTROLLED MACHINE TOOLS WITH AUTOMATIC TOOL CHANGERS ( TOOL ROTATING TYPE )

### PART 1 TOOL SHANKS

( Page 1, clause 3.1 ) — Substitute the following for the existing clause:

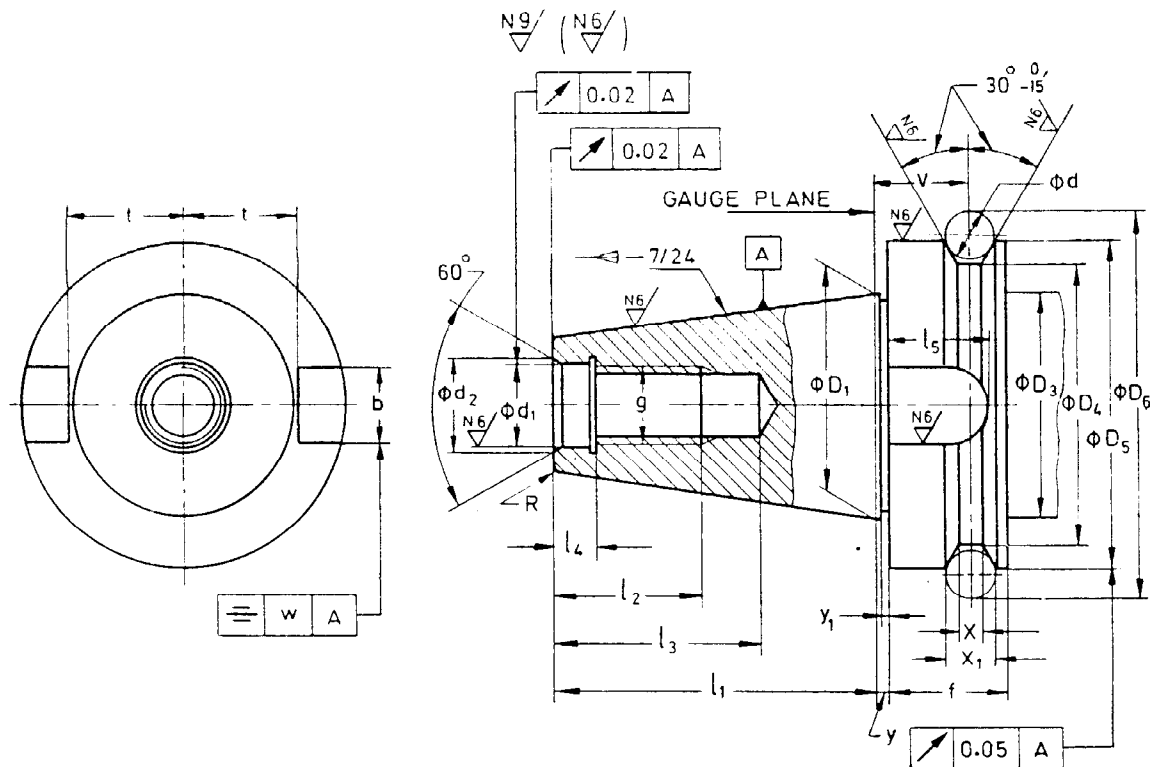
"The cone angle tolerance shall be  $+AT4$  according to IS : 7615-1975 'System of cone tolerances'."

( Page 2, Table 1, Figure ) — Substitute the figure ( see page 2 ) for the existing figure.

( Page 3, Table 1 ) — Substitute 'k' for ' $k_2$ ' and 'x' for 'X' in the top row.

( Page 3, Table 1, Note 2 ) — Substitute ' $D_2 = D_1 + \begin{smallmatrix} 0 \\ 0.03 \end{smallmatrix}$ ' for ' $D_2 = D_1 - \begin{smallmatrix} 0 \\ 0.05 \end{smallmatrix}$ '.

( Page 4, Table 2, Figure ) — Substitute the following figure for the existing figure:



( Page 4, Table 2 ) — Substitute ' $R_{Max}$ ' for ' $R_1$ ' and ' $\pm 0.1$ ' for ' $\pm 0.1$ ' in the top row.

( Page 4, Table 2 against designation B50 ) — Substitute ' $0.20$ ', ' $40.158$ ' and ' $119.020$ ' for ' $0.12$ ', ' $40.185$ ' and ' $119.019$ ' respectively.